

## ICHTHYOLOGICAL ITEMS, No. 2.

BY ALLAN R. McCULLOCH, ZOOLOGIST, AUSTRALIAN MUSEUM.

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(Plates XI-XIV.)

Holotypes, Pleisotypes, Orthotypes, Lectotypes and Logotypes, and a whole array of other types, are terms of more or less exact meaning which have been established to meet the requirements of modern taxonomy. Some are ill-defined, and have been used only by the authors responsible for them, but others are gradually gaining wider acceptance as their value becomes more evident. In the "old days," types were things of elastic quality, one specimen or a dozen being inconsequently accepted as the basis of a species, regardless of their source, though they may have come from one or a dozen different localities. The exactitudes of Gill, Bleeker, and other forerunners of more methodical classification were disregarded by most ichthyologists of their day, and were often enough discountenanced as being unworthy of the consideration of naturalists. But with the ever-increasing accumulation of data the necessity for greater accuracy became apparent, and the designation of types demanded more careful consideration than had been previously afforded it.

As noted in the introduction of Part 1 of this paper (Mem. Qld. Mus. V., 1916, p. 58), an appreciation of the value of typical specimens of fishes deposited in the various Australian Museums has developed considerably within recent years, and the specimens upon which Castlenau, Macleay, De Vis, and Johnston founded their species have been segregated from the less valuable collections in which they were lost, and duly registered, labelled, and otherwise treated as befits their great importance. Too often the actual types have disappeared, some having decayed, while the identity of others has been lost for want of a label or some distinguishing mark. But improved conditions of these collections is steadily reducing the number of lost types, and the elimination of the comparatively few fishes described by Australian authors which remain known only by their names and ludicrously meagre descriptions is gradually approaching completion.

The following paper deals with several species of fishes which have been stumbling-blocks to all who have had occasion to consider them. I am indebted to the Committee of Management of the Macleay Museum for the loan of several holotypes of species of Carangids described by the late Sir William Macleay in the early eighties of last century, which have not been recognised by any later writers. These are here redescribed and figured. The rich collection of fishes in the Queensland Museum has been recently rearranged and classified by Mr. T. C. Marshall, to whom I am indebted for much help in the rediscovery of

types of specimens described by Messrs. De Vis and Ogilby, which, as noted in the following pages, have been so imperfectly labelled that their identification has been fraught with considerable uncertainty. Mr. H. A. Longman, as Director, has afforded me every assistance, and it is entirely due to his interest that I am able to submit these conclusions. Finally, I have had much valuable help from my assistant, Mr. G. P. Whitley, in the preparation of the figures and arrangement of the paper for press.

## FAMILY MACRORHAMPHOSIDÆ.

### MACRORHAMPHOSUS ELEVATUS Waite.

(Plate XI., fig. 1, and Text-figures 1-4.)

- Centriscus scolopax* Johnston, Proc. Roy. Soc. Tasm. 1882 (1883), p. 123, and 1890 (1891), p. 34. *Id.* Macleay, Proc. Linn. Soc. N. S. Wales ix., 1884, p. 42 (not *Balistes scolopax* Linné).
- Macrorhamphosus scolopax* var. *elevatus* Waite, Mem. Austr. Mus. iv. 1, 1899, p. 59, pl. vii., fig. 1. *Id.* Fowler, P. Acad. Philad. 1907 (1908), p. 425.
- Macrorhamphosus elevatus* McCulloch, Biol. Res. "Endeavour" i. 1, 1911, p. 23, fig. 8. *Id.* Regan, Ann. Mag. Nat. Hist. (8) xiii., 1914, pp. 17, 19.
- Centriscus scolopax* var. *elevatus* Kershaw, Vict. Nat. xxiii. 6, 1906, p. 125.
- Macrorhamphosus gallinago* Ogilby, Proc. Roy. Soc. Qld. xxi., 1908, p. 6.
- Macrorhamphosus lancifer* Ogilby, New Fish. Qld. Coast, 1910, p. 90.
- ? *Macrorhamphosus robustus* Ogilby, New Fish. Qld. Coast, 1910, p. 91.

*Variation.*—In my first report upon the fishes taken by the "Endeavour," I have referred to the great range of variation exhibited by a series of over 80 specimens of this common species. Large examples are always considerably deeper than smaller ones, but apart from a marked change of form which takes place as the fish increases in size, there is also much individual variation. This affects the relative proportions of the depth as compared with the length, and causes striking differences between two specimens of similar size. The accompanying figures illustrate the extent of this variation and depict one of the more slender and the deepest of my specimens, between which is an unbroken series of intermediate forms.

The length and position of the second dorsal spine is likewise variable, being longer than the head in some (Fig. 2), but little longer than the snout in others (Figs. 3-4) and shorter than it in one example. In deep specimens it is inserted midway between the hinder margin of the eye and the end of the middle caudal rays, but is farther forward in slender examples, being midway between the hinder orbital margin and the base of the tail.

Finally, the snout is much longer proportionally in some than in others.

The accompanying figures and tabulation of variable characters not only illustrate the remarkable range of variation, but also prove that specimens which have been described as separate species by Ogilby are really referable to the one species.

MACRORHAMPHOSUS ELEVATUS. MEASUREMENTS OF SELECTED SPECIMENS, SHOWING RANGE OF VARIATION.

Data of Specimen	Total Length.	Length to Hypural Joint.	Depth before Insertion of Ventral Fin.	Head.	Eye.	Post-orbital Part of Head.	Snout from Anterior Border of Eye.	Second Dorsal Spine from Basal Plate	Locality.
Lectotype of <i>elevatus</i> (Pl. XI., fig. 1)	141 mm.	125 mm.	39 mm.	60 mm.	10.5 mm.	8.5 mm.	40 mm.	45 mm.	Off Newcastle Bight, New South Wales; 28-40 faths.
? Holotype of <i>gallinago</i> (Text-fig. 1)	121	106	30	51	10.5	7.5	32	34	Tweed River Heads
? Holotype of <i>robustus</i> (Text-fig. 3)	150	134	45	59	11	10	38	40	Queensland
Holotype of <i>lancifer</i> (Text-fig. 2)	115	98	33	47	9	7.75	30	48	Off Cape Moreton, Queensland; 70-75 fathoms
Slender specimen here figured (Text-fig. 4)	97	86	21.5	40.5	7	6.5	27.5	30	Off Eden, New South Wales; 25-30 fathoms
"Thetis" specimen identified as <i>gallinago</i> by Ogilby	136	113	33.5	54	10	8	35	36.5	Off Broughton Island, New South Wales; 29-48 fath.
"Thetis" specimen figured in Biol. Res. Endeavour i. 1, 1911, p. 24	93	81	20	40	6.66	6½	27	27	Off Broughton Island, New South Wales; 29-48 fath.
"Thetis" smallest specimen	66	57.4	17.7	28.7	6	4.9	17.7	24.1	Off Cape Three Points, New South Wales; 32-40 faths.
Most slender specimen examined	81	71	16.5	34	6	6	22	18	Maroubra Bay, Sydney

An analysis of these proportions shows that the depth at the insertion of the ventral fin varies from 4.3 to 2.9 in the length to the hypural joint; the head is 2.0 to 2.1 in the same. The length of the second dorsal spine varies from 1.8 in the head in some specimens to others in which it is 0.9 longer than the head; and the snout is 1.4 to 1.6 in the head. The post-orbital portion of the head is 1.0 to 1.4 in the eye.

*Synonymy*.—The specimen characterised and figured by Waite as *Macrorhamphosus scolopax* var. *elevatus* was one of eleven trawled during the "Thetis" Expedition, 4–6 miles off Newcastle Bight, New South Wales, 28–40 fathoms; 2nd March, 1898. All were registered under one number, *I. 3970*, and marked "type" collectively, but only one corresponds in measurements and proportions with the figure. It has therefore been selected as the lectotype, and is again figured here (Pl. XI., fig. 1).

The name *M. gallinago* Ogilby, was based upon a specimen 123 mm. long from the Tweed River Heads, New South Wales. It was deposited in the

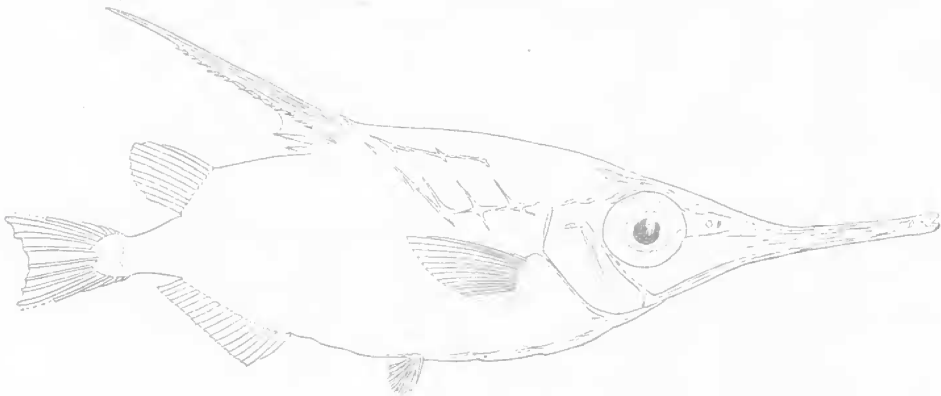


Fig. 1.—? Holotype of *M. gallinago* Ogilby, from Tweed River Heads, New South Wales; 121 mm. long.

collection of the Amateur Fishermen's Association of Queensland and entered in the Association's register by Ogilby as "No. 639 *Macrorhamphosus gallinago* Ogilby. Loc. Tweed Heads. Type." Mr. T. C. Marshall of the Queensland Museum recently searched through the A.F.A.Q. collection at my request, and found a bottle numbered 639, but labelled as "*M. elevatus*; loc. Tweed Heads." It contained three specimens of *Macrorhamphosus*, one of which corresponds in measurements and proportions with Ogilby's description of *M. gallinago*, and is evidently the holotype of that species. It is here figured (Text-fig. 1). I have already shown that *M. gallinago* is synonymous with *M. elevatus* (Biol. Res. Endeavour i. 1, p. 23). It may be noted that "the length of the body" in Ogilby's description is really the length from the end of the snout to the hypural joint; the length of the "trunk and tail" as measured by him excludes the caudal fin.



The description of *M. lancifer* Ogilby was prepared on board the trawler "Endeavour" "from a single specimen, 118 millim. long, taken in 73 fathoms on fine sand and mud, 36 miles S. 12° W. from Cape Moreton." The specimen was afterwards forwarded to the Australian Museum with the rest of the "Endeavour" collections and registered *E.* 2971 and, though unlabelled, is readily identifiable by its length and locality. It is figured (Text-fig. 2). It must be noted that the position quoted by Ogilby is incorrect, the trawl being lowered north-east instead of south-west of Cape Moreton. Regan (*loc. cit.* 1914) has already suggested the identity of *M. lancifer* and *M. elevatus*, and I find no stable characters to distinguish them.

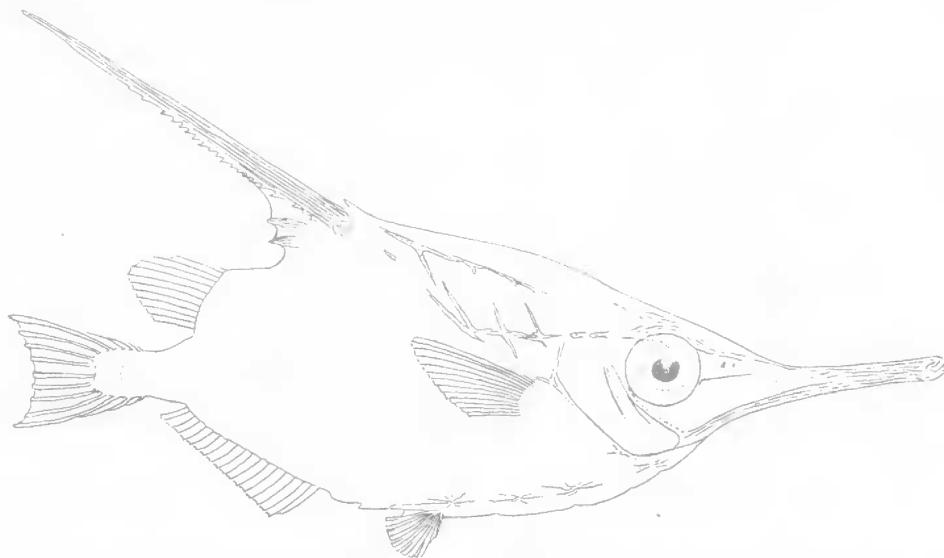


Fig. 2.—Holotype of *M. lancifer* Ogilby, from off Cape Moreton; 111 mm. long.

While describing *M. lancifer*, Ogilby established the "provisional" name *robustus* "for a Moreton Bay specimen, 6 in. long, characterised by its very stout and deep body," having the "depth of body 2·8 in its length." No specimen so labelled can now be found, but among the types of Ogilby's species which were deposited in the Queensland Museum by the Amateur Fishermen's Association of Queensland is an example registered *I.* 1562. This was entered in the register by Ogilby on 13th October, 1913, as *Macrorhamphosus*, but beyond stating that it was an A.F.A.Q. type he gave no other data as to species or locality. Though labelled by him later as *M. gallinago*, its proportions are very different to those of the *gallinago* form, and it cannot be the type of that species. It corresponds in a general way with the briefly characterised *M. robustus*, however, and may be reasonably regarded as the specimen upon which that name was based. It is figured in Text-fig. 3.

I agree with Regan that the name is merely referable to another variation of *M. elevatus*.

*Distribution*.—Southern Queensland, New South Wales, Victoria, and Tasmania. The specimens here figured are from the following localities:—

Plate XI., fig. 1.—4-6 miles off Newcastle Bight, New South Wales, 28-40 fathoms; 2nd March, 1898. Lectotype of *M. elevatus*.

Text-fig. 1.—Tweed River Heads, New South Wales. ? Holotype of *M. gallinago* Ogilby.

Text-fig. 2.—36 miles N.E. of Cape Moreton, Queensland, 70-75 fathoms; 3rd September, 1910. Holotype of *M. lancifer* Ogilby.

Text-fig. 3.—Queensland. ? Holotype of *M. robustus* Ogilby.

Text-fig. 4.—3-4 miles off Eden, New South Wales, 25-30 fathoms.



Fig. 3.—? Holotype of *M. robustus* Ogilby, from Queensland; 150 mm. long.

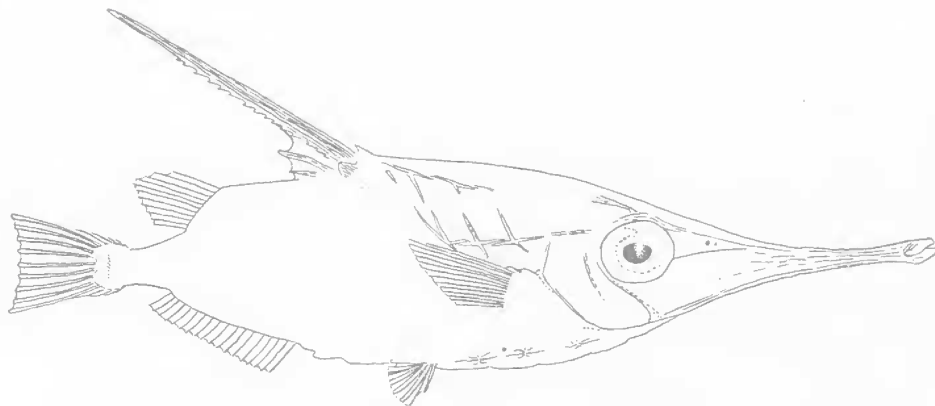


Fig. 4.—A specimen of *M. elevatus* from off Eden, New South Wales, 25-30 fathoms; 95 mm. long.

# FAMILY CARANGIDÆ.

A valuable collection of fishes from the Pellew Group in the Gulf of Carpentaria has been made by Surgeon-Lieutenant W. E. J. Paradice, R.A.N., of H.M.A.S. "Geranium." It includes various genera and species of *Carangidæ*, the satisfactory identification of which has necessitated an examination of the typical specimens of several little-known species briefly described about 1882 by the late Sir William Macleay and Mr. C. W. De Vis. Some of these prove to be referable to the synonymy of other older species as detailed in the following pages, while the specific status of a few seems to be valid. They are herein redescribed and figured accordingly. A particularly interesting genus and species, *Ulva mandibularis*, hitherto known only from the typical specimens from Papua, was secured by Dr. Paradice in Australian waters for the first time, and is here redescribed and figured.

The status of various genera and subgenera grouped with the typical *Caranx* can only be determined by a monographic study of the family. They are therefore not considered in the following provisional key, which is merely a means of identifying the species so far known from Australian waters together with a few others from Papua.

*Note.*—Care is necessary in using this key, as the principal characters, the dentition, and the squamation of the breast are evidently somewhat variable with growth. Further their gradation from one type to another is so complete in the numerous species that some forms are intermediate between two sections, and can be placed almost equally well in either of two divisions.

1. Gill-rakers normal, not projecting forward into mouth. Lips normally rounded.

*a*<sup>1</sup>. Teeth present on jaws and usually on vomer and palatines also.

*b*<sup>1</sup>. A row of larger teeth along the front and sides of each jaw, which are exterior to and markedly different from the smaller depressible inner teeth, when those are present . . . . . *Caranx*.

*c*<sup>1</sup>. Breast wholly or partially naked.

*d*<sup>1</sup>. Breast entirely naked before a line between the pectorals and the ventrals.

*e*<sup>1</sup>. Straight portion of lateral line extending forward beyond the vertical of the origin of the second dorsal, and armed with strong scutes . . . *bucculentus*.

*d*<sup>2</sup>. Breast partially naked ventrally.

*f*<sup>1</sup>. A patch of scales before the ventral fins surrounded by a naked area; body deeper . . . . . *ignobilis*.

*f*<sup>2</sup>. Breast wholly naked on the ventral surface; general form more slender *papuensis*.

*c*<sup>2</sup>. Breast entirely scaly.

*g*<sup>1</sup>. Straight portion of lateral line much shorter than curved portion. A single row of teeth in each jaw.

*h*<sup>1</sup>. Depth equal to or but little greater than length of head . . . *georgianus*.

*h*<sup>2</sup>. Depth much greater than length of head . . . *platessa*.

*g*<sup>2</sup>. Straight portion of lateral line longer than curved portion; upper jaw with an inner band of villiform teeth.

*i*<sup>1</sup>. Maxillary reaching backward beyond vertical of anterior margin of eye; mandibular teeth in a single row . . . *forsteri*.

*i*<sup>2</sup>. Maxillary not reaching vertical of anterior margin of eye . . . *valenciennei*.

- b*<sup>2</sup>. No outer row of larger teeth in the jaws, though some fixed conical teeth may be present exterior to the smaller inner depressible ones, if those are present.
- j*<sup>1</sup>. Breast wholly or partially naked.
- k*<sup>1</sup>. Breast entirely or largely naked before a line between the pectoral and ventral fins.
- l*<sup>1</sup>. A band of teeth in each jaw; microscopic teeth on vomer and palatines.
- m*<sup>1</sup>. Straight portion of lateral line shorter than curved part.
- n*<sup>1</sup>. Depth between origin of first dorsal and ventrals greater than length of soft dorsal.
- o*<sup>1</sup>. Anterior dorsal and anal rays longer than the bases of those fins.
- p*<sup>1</sup>. Dorsal with 22-24 rays; anterior anal ray reaching beyond base of posterior ray . . . . . *altissimus*.
- p*<sup>2</sup>. Dorsal with 20-21 rays; anterior anal ray not reaching base of posterior ray . . . . . *armatus*.
- o*<sup>2</sup>. Anterior dorsal and anal rays shorter than the bases of those fins.
- q*<sup>1</sup>. Eye shorter than postorbital portion of head . . . . . *chrysophrys*.
- q*<sup>2</sup>. Eye nearly as long as postorbital portion of head . . . . . *malabaricus*.
- n*<sup>2</sup>. Depth between origin of first dorsal and ventrals distinctly less than length of second dorsal . . . . . *humerosus*.
- m*<sup>2</sup>. Straight portion of lateral line longer than curved part . . . . . *oblongus*.
- l*<sup>2</sup>. Teeth in single rows on sides of jaws, in two rows anteriorly; straight portion of lateral line longer than curved portion . . . . . *aurochs*.
- k*<sup>2</sup>. Breast naked ventrally, but scales extend forward on the sides in advance of a line between the pectorals and ventrals.
- r*<sup>1</sup>. Margins of second dorsal and anal fins more or less excised, the anterior rays longer than the others.
- s*<sup>1</sup>. Scutes of lateral line confined to posterior third of its length, the anterior portion feebly arched; about 29 dorsal and 26 anal rays.
1. Anterior dorsal rays very elongate, produced into a falcate lobe; depth at origin of second dorsal less than half the length to middle of caudal peduncle, and equal to or less than length of second dorsal . . . . . *ferdau*.
2. Anterior dorsal rays longer than the others but not produced into a falcate lobe; depth at origin of second dorsal equal to half the length to middle of caudal peduncle, and greater than length of second dorsal . . . . . *laticaudis*.
- s*<sup>2</sup>. Scutes of lateral line extending along posterior half of its length, the anterior portion distinctly arched; about 21 dorsal and 18 anal rays; broad bands of villiform teeth in the jaws, the outer series somewhat enlarged and widely set . . . . . *gracilis*.
- r*<sup>2</sup>. Margins of second dorsal and anal fins rounded, all the rays greatly produced . . . . . *hullianus*.
- j*<sup>2</sup>. Breast entirely or almost entirely scaly.
- l*<sup>1</sup>. Abdominal profile markedly more deeply convex than the dorsal; eye longer than snout.
- u*<sup>1</sup>. Body greatly compressed; lateral line armed with broad scutes; premaxillary teeth in two series, the outer tubercular, stout, and in a single row, the inner villiform and in a narrow band; mandibular teeth in a single row except anteriorly . . . . . *kalla*.  
(*C. parasitus* Garman apparently belongs to this section.)

- t*<sup>2</sup>. Abdominal profile equally or less convex than the dorsal; eye shorter than snout.
- v*<sup>1</sup>. Body stout, its depth subequal to the length of the head; teeth minute, curved, not juxtaposed .. .. . *affinis*.
- v*<sup>2</sup>. Body compressed, its depth greater than the length of the head.
- w*<sup>1</sup>. Teeth in a single row, cardiform and juxtaposed; none of the dorsal and anal rays produced. (Palate toothless ?) .. .. . *malam*.
- w*<sup>2</sup>. Teeth minute, conical, not juxtaposed, in several rows anteriorly in premaxillaries, in single row on sides and on mandible. Many dorsal and anal rays produced into free filaments. Vomer and palatines with teeth .. .. . *radiatus*.
- a*<sup>3</sup>. Teeth of jaws either lacking or infinitesimal .. .. . *Gnathanodon*.
- y*<sup>1</sup>. 19-21 dorsal and 16-17 anal rays. Palate toothless.
- z*<sup>1</sup>. Depth at origin of second dorsal subequal to length of base of that fin .. .. . *speciosus speciosus*.
- z*<sup>2</sup>. Depth at origin of second dorsal greater than the length of the base of that fin .. .. . *speciosus obtusiceps*.
- y*<sup>2</sup>. 26-27 dorsal and 23 anal rays; palate with microscopic teeth; a dark blotch on shoulder .. .. . *leptolepis*.
2. Gill-rakers very long and numerous, projecting forward into the mouth on each side of the tongue. Lips sharp-edged. Breast entirely naked before a line between the pectoral and ventral fins. A patch of microscopic teeth on the vomer, and a very narrow band on each palatine. Body greatly compressed, its profiles angular .. .. . *Ulua*.
14. Depth at origin of second dorsal almost equal to half the length to the hypural joint; dorsal and anal rays produced .. .. . *mandibularis*.

**CARANX PAPUENSIS** Alleyne & Macleay.

(Plate XIII.)

*Caranx papuensis* Alleyne & Macleay, Proc. Linn. Soc. N.S. Wales i. 4, 1877, p. 325, pl. x., fig. 3.

D. viii., i/22; A. ii., i/18; P. 21; V. i/5; C. 17.

Length to the end of the middle caudal rays, 136 mm. Depth at the origin of the second dorsal fin (49 mm.), 2·5 in the length to the hypural joint (124); head (37) 3·3 in the same. Eye (10) as long as the snout, and 3·7 in the head; interorbital space subequal to the width of the eye. Pectoral fin (47) 0·2 longer than the head.

Body greatly compressed and elevated. The upper profile from the snout to the caudal peduncle forms an even and very convex curve, which is much more arched than the lower profile. Hinder angle of the maxillary almost reaching the vertical of the middle of the eye; it is broad and obliquely truncate posteriorly, with a broad supplemental bone. Adipose eyelid broad posteriorly but not covering the pupil. Preopercular edge membranaceous, smooth and broadly rounded. Cheek, upper portion of operculum, and temporal region covered with small scales; the snout, interorbital space and a median area extending back to the origin of the first dorsal are naked.

Premaxillaries with an outer row of strong conical teeth which are largest anteriorly and become smaller backward; an inner band of villiform

teeth on each side. Mandibular teeth in a single row, and much smaller than those of the outer series of the premaxillaries. A small patch of teeth on the vomer and a band of minute ones on each palatine; the roof of the mouth and the tongue also bear many patches of microscopic teeth. Eighteen slender gill-rakers on the first gill-arch, of which those at the posterior angle are half as long as the eye.

Body covered with scales of moderate size which extend forward on the sides to the isthmus, but leave the ventral surface of the breast naked; this naked area is sharply defined on each side, and is broadest just before the ventral fins, becoming narrower anteriorly. A few scales implanted in advance of the ventral fins suggest that this area has been denuded, though no scale-pits can be traced on the naked area. A low scaly sheath covering the bases of the dorsal and anal fins. Lateral line strongly arched anteriorly, becoming straight below the eighth dorsal ray and well before the middle of its length; the whole of the straight portion is armed with scutes, which increase in size backward to the caudal peduncle, where they cover about two-thirds of its width.

Dorsal spines slender, imperfect in the type, the third a little shorter than the postorbital portion of the head. Anterior dorsal rays imperfect, but elevated into a high lobe. Anal produced into a falcate lobe anteriorly and preceded by two strong spines. Pectoral falcate, reaching beyond the angle of the lateral line. Ventrals inserted below the pectorals. Caudal deeply forked.

*Colouration*.—Silvery, darker on the back.

Described and figured from the holotype in the Macleay Museum. It differs from Macleay's description in having the breast naked instead of scaly but as noted above this may have been denuded. A second specimen in the Australian Museum from the Solomon Islands has the breast similarly naked but, apart from this character, both are quite similar to *C. forsteri* with which *C. papuensis* may prove to be identical.

Macleay recorded that he had two specimens, the largest 6 inches long. This last is the specimen here described and figured. The other is also preserved in the Macleay Museum, and is only a couple of inches long; it is apparently referable to *C. forsteri*.

*Locality*.—Hall Sound, Papua.

#### CARANX MELAMPYGUS (Cuv. & Val. ?) Gunther.

(Plate XI. ; Fig. 2.)

*Caranx melampygus* Cuvier & Valenciennes, Hist. Nat. Poiss. ix., 1833, p. 116.

*Caranx stellatus* Edoux & Souleyet, Voy. Bonite, Poiss., 1841, p. 167, pl. iii., fig. 2. *Id.* Jordan & Jordan, Mem. Carnegie Mus. x. 1, 1922, p. 40.

*Caranx melampygus* Gunther, Fishes Sudsee v., 1876, p. 133, pl. lxxxvi. *Id.* Macleay, Proc. Linn. Soc. N. S. Wales vii., 1882, p. 355.

*Carangus melampygus* Jordan & Evermann, Bull. U.S. Fish. Comm. xxiii. i., 1905, p. 192, fig. 73.

? *Caranx moresbiensis* Macleay, Proc. Linn. Soc. N. S. Wales vii., 1882, p. 358.



D. viii., i/23; A. ii., i/19; P. 20; V. i/5; C. 17.

Length to end of middle caudal rays 203 mm. Depth at the origin of the second dorsal (71 mm.) 2.6 in the length to the hypural joint (188); head (57) 3.2 in the same. Eye (12) 1.6 in the snout (20); interorbital space (15) 3.8 in the head. First dorsal ray (41) 1.3 in the head. Pectoral fin (68) 0.1 longer than the head.

Body much compressed; upper profile from the snout to the origin of the first dorsal strongly arched and keeled and much more convex than the lower, which forms an oblique line from the isthmus to the origin of the anal. Hinder angle of the maxillary reaching the vertical of the anterior third of the eye; it is obliquely truncate posteriorly with a broad supplementary bone. Adipose eyelid broad posteriorly but not covering the pupil. Preopercular edge membranous, finely crenulate, its hinder margin subvertical and the angle broadly rounded. Cheek, upper portion of operculum and temporal region with small scales; the snout, interorbital space and a median area extending backward to the origin of the first dorsal naked.

Premaxillaries with a row of strong conical teeth and a narrow band of small villiform ones. Mandible with a row of strong teeth on each side which are smaller than those of the premaxillaries; no inner band of smaller teeth. A small triangular patch of minute teeth on the vomer and a broad band on each palatine; a band extends along the median line of the tongue. Eighteen gill-rakers on the lower limb of the first gill-arch; those at the posterior angle more than half as long as the eye.

Body covered with scales of moderate size which almost completely cover the breast, leaving only a tiny patch near the isthmus bare. Bases of the pectoral fins naked; the dorsal and anal fins have scaly sheaths covering the basal portions of their anterior rays. Lateral line strongly arched to below the anterior dorsal rays, the arched part being 1.4 in the length of the posterior straight portion; almost all of the posterior part is armed with scutes which increase in size backward to the caudal peduncle, where they are equal to about two-thirds of its width. An oblique keel on each side of the base of the tail.

Dorsal spines slender, the third highest and but little shorter than the length of the postorbital portion of the head. Anterior dorsal rays produced into a falciform lobe. Anal similar to the dorsal. Ventrals inserted slightly behind the vertical of the bases of the pectorals. Pectorals falcate, reaching well beyond the angle of the lateral line. Caudal deeply forked.

*Colouration*.—Silvery after long preservation in alcohol, the upper half darker.

Described and figured from a specimen in the Macleay Museum collection. It is labelled as *C. moresbyensis* Macleay (Proc. Linn. Soc. N. S. Wales vii., 1882, p. 358), and being the only specimen in the collection bearing that name, was supposed to be the holotype of the species. According to Macleay's meagre description, however, the type was only two inches long, so although this



specimen agrees in a general way with *C. moresbyensis* as characterised, it affords no reliable evidence to determine the true status of that species.

*Locality*.—Port Moresby, Papua.

**CARANX LEPTOLEPIS** Cuvier & Valenciennes.

(Text-fig. 5-6.)

*Caranx leptolepis* Cuvier & Valenciennes, Hist. Nat. Poiss. ix., 1833, p. 63. *Id.* Gunther, Brit. Mus. Cat. Fish. ii., 1860, p. 440. *Id.* Day, Fish. India, 1878, p. 225, pl. li., fig. 4. *Id.* McCulloch, Biol. Res. "Endeavour" iii. 3, 1915, p. 129, pl. xxi.

*Caranx cheverti* Macleay, Proc. Linn. Soc. N. S. Wales i., 1877, p. 324, pl. x., fig. 1.

*Caranx procaranx* De Vis, Proc. Linn. Soc. N. S. Wales ix., 1884, p. 540.

*Synonymy*.—As already shown,<sup>1</sup> *Caranx cheverti* Macleay is synonymous with *C. leptolepis*. The holotype, here illustrated (Fig. 5), has been borrowed from the Macleay Museum for the purpose. It is 138 mm. long to the end of the middle caudal rays and exhibits the following characters:—

D. viii., i/25; A. ii., i/22; V. i/5; P. 18; C. 17.

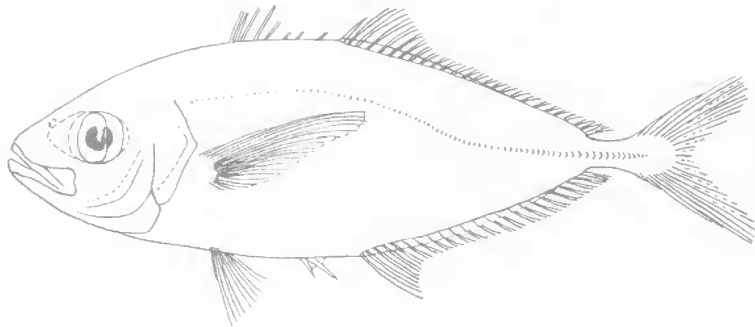


Fig. 5.—*Caranx leptolepis*. Holotype of *C. cheverti* Alleyne & Macleay, from Katow, New Guinea.

Depth at origin of second dorsal (43 mm.) 2.9 in the length to the hypural joint (127); head (37) 3.4 in the same. Eye (11) as long as its distance from the end of the snout, 3.3 in the head.

Body entirely covered with small scales which extend over the breast. Straight portion of the lateral line a little shorter than the curved part, armed with about 23 scutes which merge into the scales anteriorly; broadest scutes are scarcely one-third of the width of the caudal peduncle. Jaws practically toothless; a very few microscopic teeth are present near the mandibular symphysis, and two occur at widely spaced intervals on one side of the lower jaw; premaxillaries, vomer and palatines toothless. A broad adipose eyelid posteriorly and a narrow anterior one. The sides are silvery and the back dark, the junction of the two sharply defined. A large round spot below the commencement of the lateral line and extending over the end of the operculum.

<sup>1</sup> McCulloch, Biol. Res. "Endeavour" iii. 3, 1915, p. 130.

I am indebted to Mr. H. A. Longman, Director of the Queensland Museum, for the loan of the holotype of *Caranx procaranx* De Vis (Fig. 6). This specimen is 80.5 mm. long to the hypural joint, and is in a somewhat dilapidated condition, but having compared it with specimens of *C. leptolepis* I find it agrees in all details. It has the following characters:—D. vii. (?), i/26; A. ii, 2/23; V. i/5; P. 20; C. 17.

Depth at origin of second dorsal (28 mm.) 2.8 in the length to the hypural joint (80.5); head (23.5) 3.4 in the same. Eye (7.5) 0.1 longer than the snout (6.5), and 3.1 in the head.

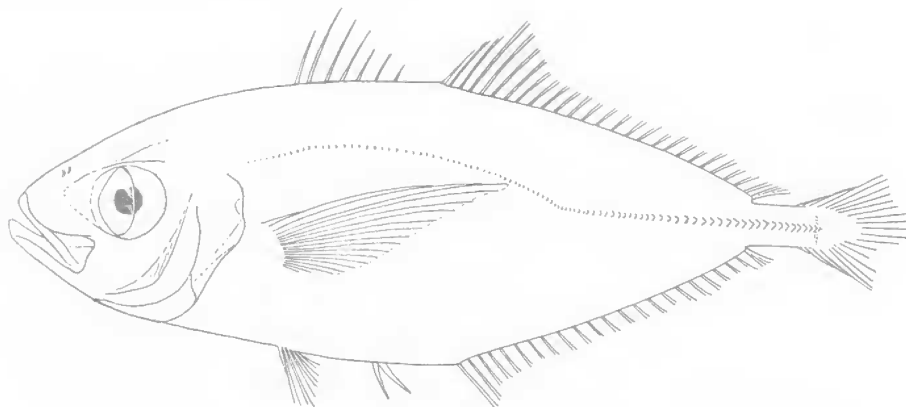


Fig. 6.—*Caranx leptolepis*. Holotype of *C. procaranx* De Vis, from Cape York, Queensland.

The body has been entirely covered with small scales, which extended over the breast. Straight portion of the lateral line a little shorter than the curved part, and armed with about 25 narrow scutes which merge into the scales anteriorly; the broadest scutes are less than one-third as wide as the caudal peduncle. A few microscopic teeth are present near the symphysis of the premaxillaries; the rest of the jaws, vomer and palatines are toothless. A broad adipose eyelid posteriorly, and a narrower one anteriorly. The sides are largely silvery with a dark area on the back sharply defined; a dark blotch on the end of the operculum apparently extends onto the shoulder.

This specimen differs from De Vis' description in several important details, but there can be no doubt that it is his actual holotype, and that the discrepancies are due to the usual inaccuracies common to his descriptions. He described the lateral line as "armed throughout, but the plates of the curved portion are smaller than those of the straight." The specimen shows that the scales of the lateral line are adherent, whereas they have been lost from both sides of it, and the so-called armature of the greater portion consists merely of ordinary scales. The larger scales which he described as irregularly scattered among the smaller ones are merely a few which have remained adherent, and appear conspicuous and large among the scale-pits which cover the greater portion of the body.

*Localities.*—*Caranx leptolepis* is, so far, known in Australia only from Queensland waters. The holotype of *C. chererti* was collected at Katow, New Guinea, while that of *C. procaranx* was taken at Cape York.

**CARANX LATICAUDIS** Alleyne & Macleay.

(Plate XII.)

*Caranx laticaudis* Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales i., 1877, p. 325, pl. x., fig. 2.

D. viii., 1/29; A. i., 1/26; P. 1/22; V. i/5; C. 17.

Length to the end of the middle caudal rays, 262 mm. Depth at the origin of the second dorsal (116 mm.) 2.06 in the length to the hypural joint (240); head (68) 3.5 in the same. Eye (15) 1.3 in the snout (20); interorbital space (23) 2.9 in the head. Pectoral fin (92) 0.3 longer than the head.

Body much compressed; the upper profile from the snout to the origin of the second dorsal is sharply keeled and is more strongly arched than the lower, which forms an oblique line from the chin to the origin of the anal. Hinder angle of the maxillary just reaching the vertical of the anterior border of the eye; it is obliquely truncate posteriorly, with a large supplemental bone above it. Adipose eyelid forming a narrow rim which encircles the eye. Preopercular edge finely crenulate, its hinder margin vertical and the angle broadly rounded. Cheek, operculum and temporal regions largely covered with small scales; the snout, interorbital space, and a narrow median area extending backward to the origin of the first dorsal are naked.

Premaxillaries with a band of small teeth on each side, which is broadest anteriorly and becomes narrower as it extends backward; a few of the outer teeth are a little larger than the others, conical, and fixed, but there are no caniniform teeth. Mandible with a narrow band of small teeth on each side, the outer ones larger than the others. A broad patch of minute teeth on the vomer, a narrow band on each palatine, and others on the tongue. Eighteen gill-rakers on the first gill-arch, those at the angle about half as long as the eye.

Body covered with very small scales, but the breast in advance of the ventral fins is naked; this naked area is restricted to the ventral surface posteriorly, but it becomes broader and extends a little way up the sides anteriorly. The bases of the pectoral fins are naked; the dorsal and anal fins have broad scaly sheaths covering the basal portions of their rays. Lateral line feebly arched anteriorly, becoming straight at the tips of the pectoral fins, and behind the middle of its length. About one-fourth of the lateral line is armed with scutes, which are well developed on the caudal peduncle, but become rapidly smaller and merge into the other scales well behind the point where the straight portion commences to arch forward.

Dorsal spines weak, the fourth highest and about as long as the eye;

the eighth spine is much stouter than the others, and stands isolated between the two dorsal fins. Anterior dorsal rays damaged but apparently shorter than the postorbital portion of the head; they form a short angular projection but not a falciform lobe. Anal produced into a falcate lobe anteriorly, the first ray much longer than the postorbital portion of the head; a single weak and isolated spine precedes the anal fin. Pectoral falcate. Ventrals inserted well behind the pectorals, but a little before the vertical of the first dorsal spine; the spine is slender and much shorter than the first ray. Caudal broadly forked.

Colouration silvery after long preservation in alcohol, the back darker.

Described and figured from the unique holotype in the Macleay Museum. It differs from Macleay's brief description in having 29 instead of 26 dorsal rays, but its authenticity is beyond doubt.

This species is very close to *C. ferdau* Forskal, but the only specimen known differs from the figures and descriptions of that species in having a deeper body, and in lacking the anterior falcate lobe of the second dorsal. It resembles *ferdau* in its dentition, squamation, form of the lateral line, large number of dorsal and anal rays, and weak anal spines, and clearly belongs to the same subdivision of *Caranx* as that species.

*Locality*.—Hall Sound, near Yule Island, Papua; collected by Sir William Macleay during his expedition to New Guinea in 1875 in the "Chevert."

#### ULUA MANDIBULARIS Macleay.

(Plate XIV.)

*Caranx mandibularis* Macleay, Proc. Linn. Soc. N. S. Wales viii., 1883, p. 356.

*Ulua mandibularis* McCulloch, Biol. Res. "Endeavour" iii. 3, 1915, p. 140.

D. vii., 1/20; A. ii., 1/17; V. i/5; P. 20; C. 17. About 20 scutes on the lateral line.

Length to the end of the middle caudal rays 256 mm. Depth at the origin of the second dorsal (114 mm.) 2.1 in the length to the hypural joint (241); head, excluding the mandible (70), 3.4 in the same. Eye (20) as long as the snout, and 3.5 in the head; interorbital width (18) but little less than the length of the eye. Pectoral fin (103) 0.4, and first dorsal ray (95) 0.3 longer than the head; first anal ray (63) 1.1 in the head.

Body greatly compressed; the upper profile from the snout to the origin of the second dorsal sharply keeled and markedly convex on the nape and slightly concave on the snout; it is more arched than the lower profile. Mandible broad and compressed, the chin projecting, forming an obtuse angle in advance of the upper jaw. Hinder angle of the maxillary reaching the vertical of the anterior margin of the pupil; it is obliquely truncate posteriorly, with a

moderately broad supplemental bone. Adipose eyelid forming a narrow rim which encircles the eye. Preopercular border entire and broadly rounded. Part of the cheek, the upper part of the operculum and a small area on the temporal region are scaly; the remainder of the head and a narrow median area extending backward to the first dorsal spine are naked.

A single row of microscopic teeth in the upper and lower jaws, and a patch on the vomer; palatines apparently toothless. Lips sharp edged. Gill-rakers very long, projecting forward in the mouth, almost to the level of the vomer; there are fifty on the lower limb of the first gill-arch, and those at the hinder angle are about three-fourths as long as the eye.

Body covered with small scales, but the whole breast in advance of an oblique line from behind the ventral rays to the lower base of the pectoral is naked; the bases of the pectoral fins are also naked. Dorsal and anal fins with broad scaly sheaths covering the anterior three-fourths of their lengths. Lateral line strongly arched anteriorly, becoming straight below the ninth dorsal ray and a trifle in advance of the middle of its length. There are about 20 scutes which are strong on the caudal peduncle but decrease rapidly in size forward and merge into the scales anteriorly on the straight portion. Two oblique ridges on each side of the base of the tail.

Dorsal spines weak, the third highest and scarcely longer than the eye; sixth spine minute, the seventh stronger and isolated in advance of the second dorsal. Anterior ray greatly produced, the four following successively shorter; the remainder subequal in length. Anal similar to the dorsal but with the anterior rays shorter. Pectoral strongly falcate, reaching backward beyond the middle of the dorsal and anal fins. Ventral small, with very weak spines, reaching backward half their distance from the anal. Caudal deeply forked.

*Colouration*.—Olive-green above, silver below; the junction of the two colours sharply defined above the middle line of the body. The edges of the caudal and anal blackish, the inner axil of the pectoral black.

Described and figured from a specimen, 256 mm. long, from the premaxillary symphysis to the end of the middle caudal rays.

Macleay has described the head as free of scales, but there are really numerous small scales on the cheeks and upper parts of the opercles.

*Affinities*.—The two typical specimens of this species are preserved in the Macleay Museum, and a co-type is in the Australian Museum. They are very similar to the figure of *U. richardsonii*<sup>2</sup> but have the frontal profile a little more convex, the eye larger, and a few more anal rays.

*Locality*.—Sir Edward Pellew Islands Group, Gulf of Carpentaria; coll. Dr. W. E. J. Partridge, R.A.N., June, 1923. This genus and species has not been hitherto recognised from Australian waters, the types from near Port Moresby being the only specimens previously recorded.

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<sup>2</sup> Jordan and Snyder.—Mem. Carnegie Mus. iv., pt. 2, 1908, p. 39, pl. liii.

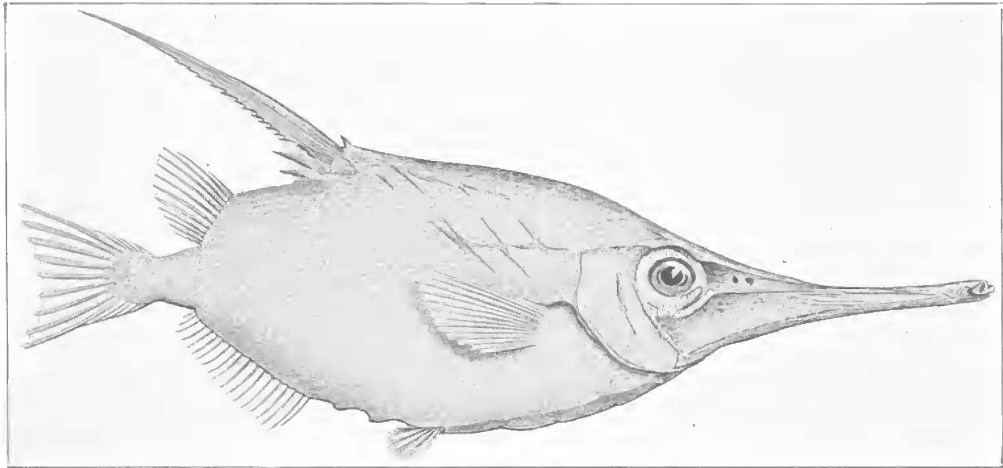


Fig. 1.—Lectotype of *Macrorhamphosus elevatus*, from Newcastle Bight. 140 mm. long.

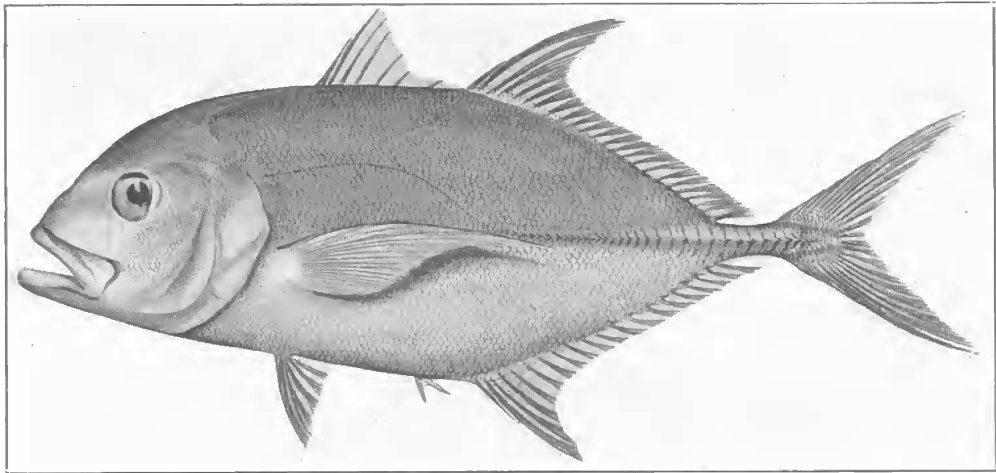


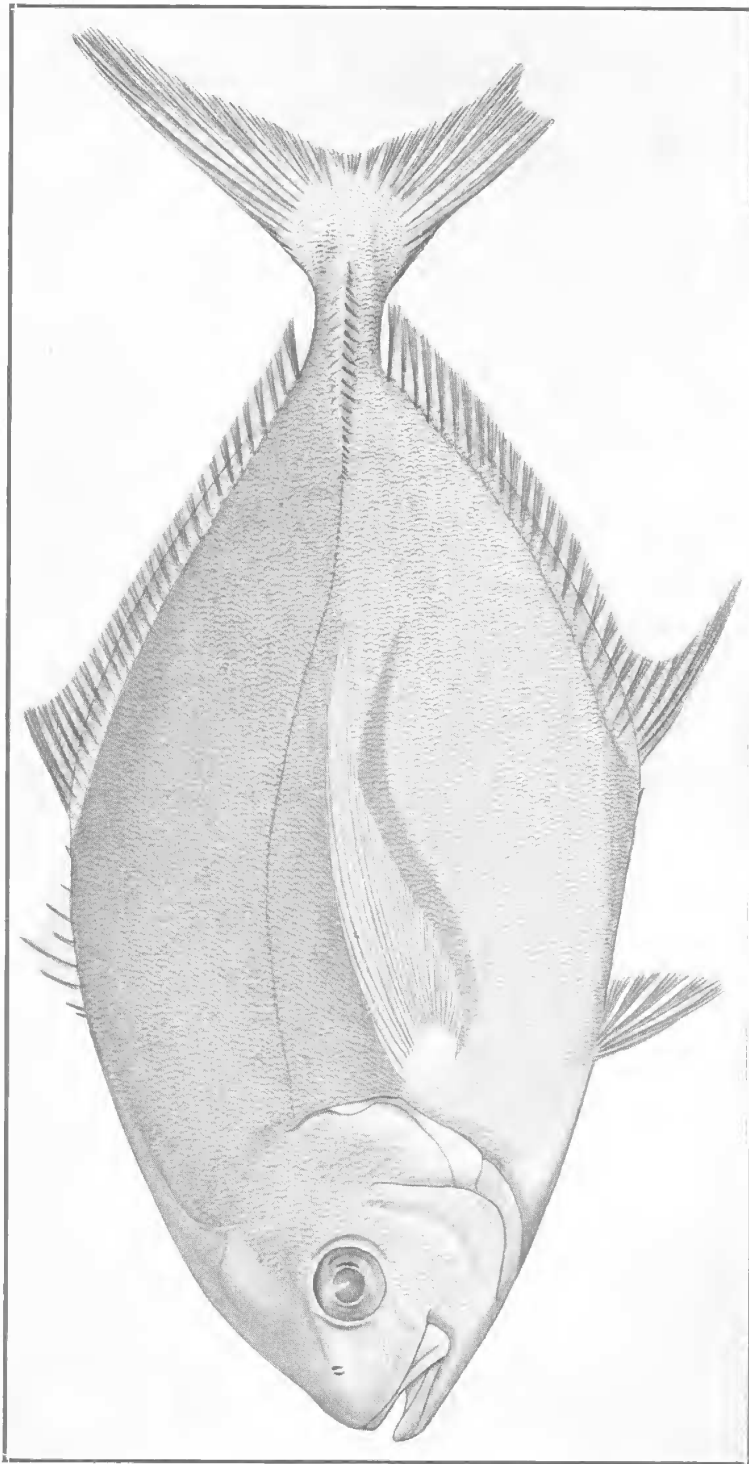
Fig. 2.—*Caranx melampygus* Cuvier & Valenciennes.

A specimen, 203 mm. long to the end of the middle caudal rays, from Port Moresby, Papua.

*A. R. McCulloch, del.*

Face page 76.



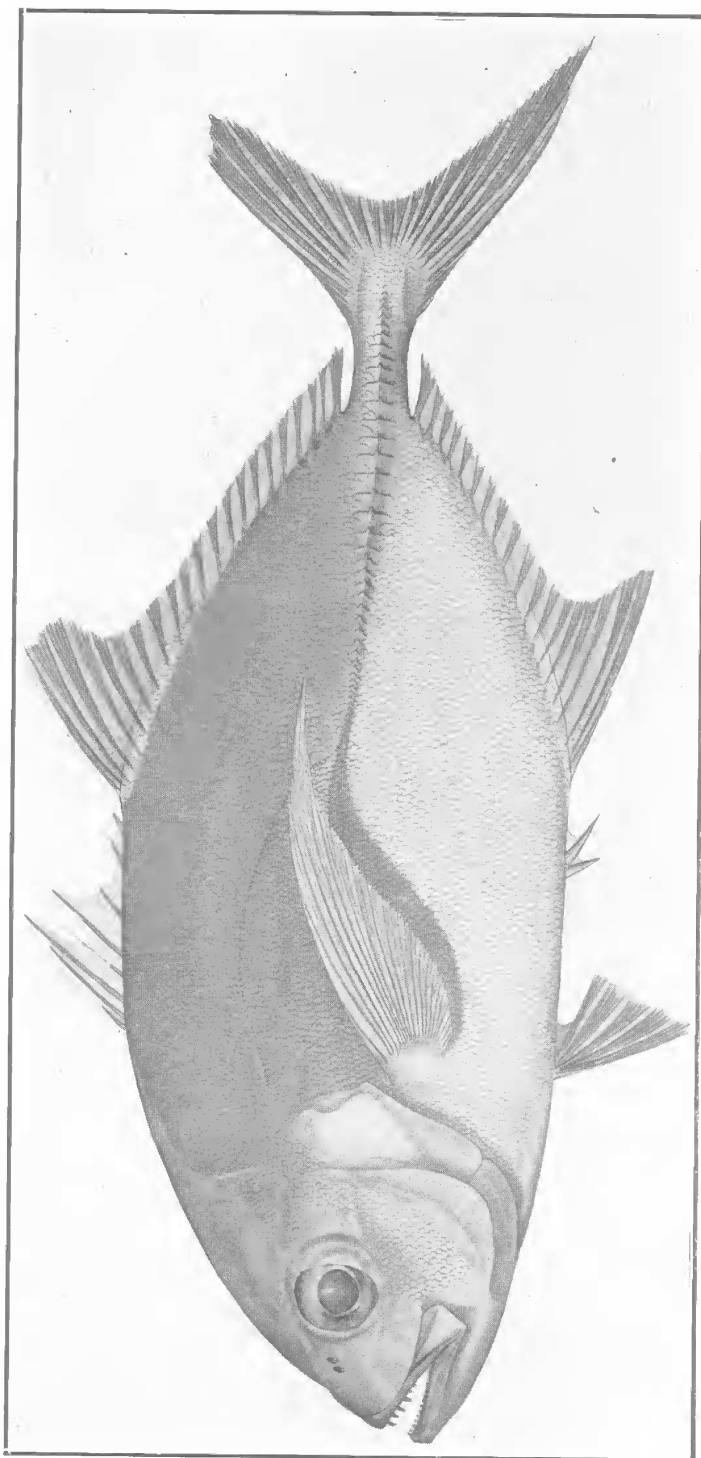


*CARANX LATICAUDIS* Alleyne & Macleay.

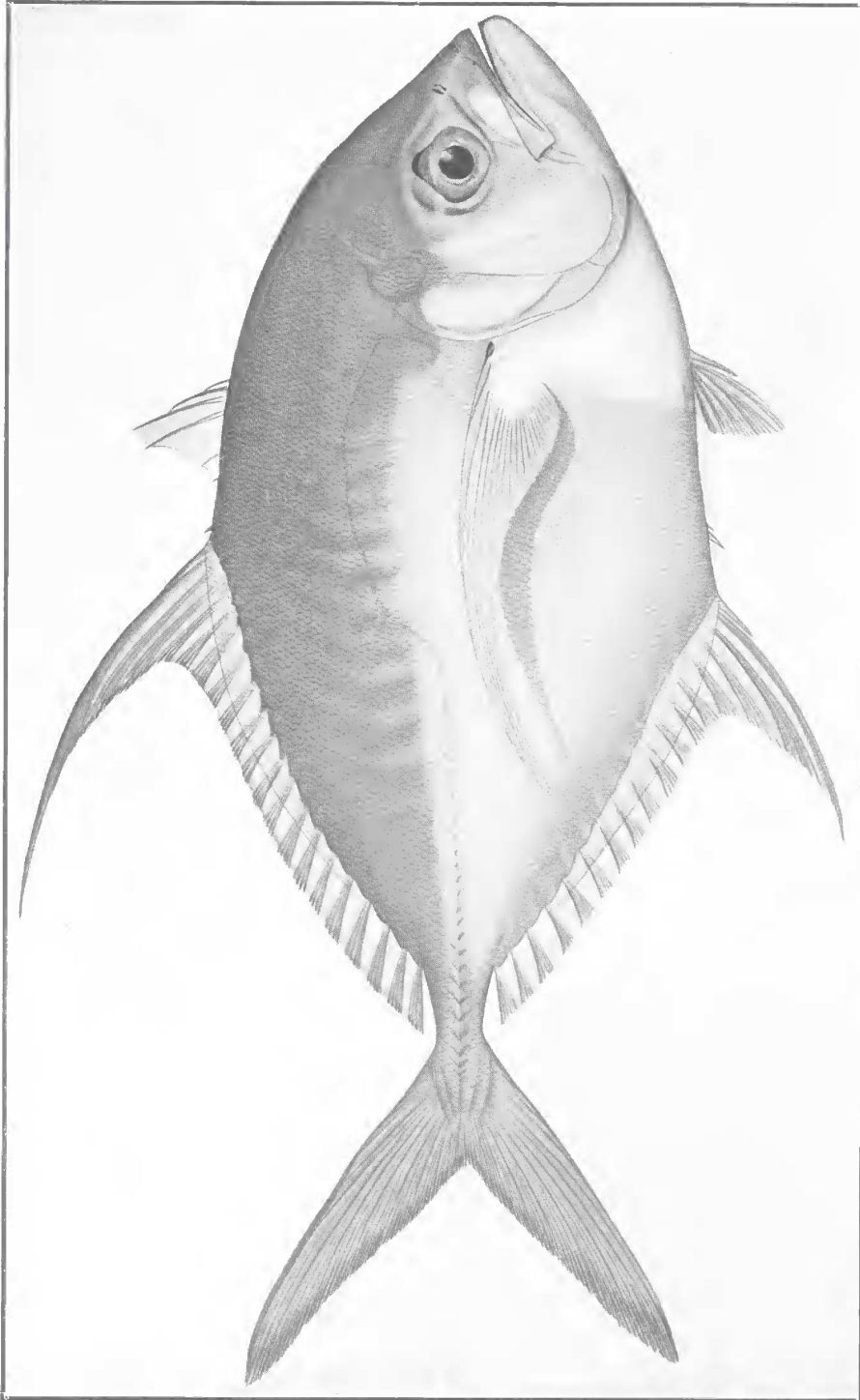
Holotype, 262 mm. long to the end of the middle caudal rays, from Hall Sound, Papua.

*A. R. McCulloch, del.*





*CARANX PAPUENSIS* Alleyne & Macleay.  
Holotype, 136 mm. long to the end of the middle caudal rays, from Hall Sound, Papua.  
*A. R. McCulloch, del.*



*ULUA MANDIBULARIS* Macleay.

A specimen 256 mm. long to the end of the middle caudal rays, from Sir Edward Pellew Islands Group, Gulf of Carpentaria.

A. R. McCulloch, *del.*